The American Biology Teacher

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teaching the life sciences from elementary grades through college

JANUARY, 1953 **Vol. 15, No. 1**

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Publication of the National Association of Biology Teachers.

Issued monthly during the school year from October to May. Entered as second class matter October 26, 1939, at the post office at Lancaster, Pa., under the Act of March 3, 1879.

Publication Office—111 E. Chestnut St., Lancaster, Pa.

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Subscriptions, renewals, and notices of change of address should be sent to the Secretary-Treasurer, John P. Harrold, 110 E. Hines Ave., Midland, Mich. Correspondence concerning advertising should be sent to the Managing Editor.

The entire Staff List will be found in the March and November issues.

Annual membership, including subscription, $2.50, outside United States, $3.00.

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THE COVER PICTURE was submitted by Charles A. Goddard, biology teacher of Chaffee High School, Chaffee, Missouri. For technical data and other information, see Mr. Goddard's letter on page 14.

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The American Biology Teacher

Vol. 15 JANUARY, 1953 No. 1

Does the Teacher Hold the Missing Section?

The above title refers to "Education for Wise Management," which is shown as one third of a three-way program, the other two being, "Preservation" and "Restoration." *Education for Wise Management* was the subject of a seminar held at Florida State University during the summer of 1952, in cooperation with the Conservation Project of NABT.

The two articles presented here, in somewhat abridged form, are parts of the 130-page report of the Florida Seminar. Margaret H. Oliver and Joan Woods, the authors, were participants in the seminar.

The School Garden, an Outdoor Laboratory for Teaching

MARGARET H. OLIVER, Santa Clara Elementary School, Miami, Florida

The opportunities which gardening offers vary according to the community in which the school is located. Each class may have an individual plot. Contests between classes may create interest. Produce may be used by the school, taken home by the pupils, or sold. Flowers for decorating the school can be grown. The school garden can be valuable as an outdoor laboratory for school programs of study in science, home economics, agriculture, and mathematics. The activities may easily be projected into nutrition, social studies, art, and language arts. Children can learn how to measure land; how to select garden sites; how to prepare soil for planting; how to select suitable varieties of plants for planting; how to plant and care for their growth; how and when to harvest; and how to store, freeze, and can surplus produce. They get experience in obtaining material from people and working with agencies in the community. Much information learned about gardening at school may be practiced at home.

The school garden may be planned according to the age and needs of the group. One teacher may do much alone, but it is well to use the resources of the school staff and to encourage the cooperation of all sources available. Some of these sources may be the custodian, parents, nurserymen, county agents, county home demonstration agent, and representatives of the Soil Conservation Service.

The school garden is a project which may be developed in a minimum of time, which would be just long enough for the life cycle of a plant; or a maximum of time, which might extend over one or more years.

The opportunities of a school garden, as one

realizes after careful consideration, are unlimited. In order to show how this project may be developed, the work done during one year, by a seventh and eighth grade group of a four-teacher rural school, is described.

The idea of the school garden developed at the beginning of the second year of a project for the improvement of the school environment. The first year, much time was spent improving and beautifying the interior of the building. The decoration of the lunchroom led to an enthusiastic interest in the lunch program. This interest led the seventh and eighth grade group to select as their project the growing of fresh vegetables for the school cafeteria and the growing of flowers for decorating the school. There were about twenty children in the combined classes. The number of boys and girls was equal. An integrated course in "Everyday Living" was being taught to both grades. This gave ample opportunity for planning and research in the classroom and for work in the garden when necessary. The same teacher taught the group all day; therefore, there was no difficulty in scheduling time for work in the garden. Interest in the project soon spread into the whole school.

The activities which developed during the year in connection with the school garden were too numerous to be described in this paper. Many of the activities carried on by the seventh and eighth grades are listed, but only those leading up to the planting of the garden are described. Some of the activities carried on during the year were:

1. Obtaining the site for the garden
2. Making soil profiles
3. Selecting the site for the garden
4. Writing for material
5. Determining what vegetables and flowers to grow
6. Selecting the varieties
7. Securing and improvising equipment for preparing and cultivating the soil
8. Making a chart of the garden
9. Measuring the ground
10. Preparing the soil
11. Planting a seed bed
12. Making soil tests and determining the fertilizer and treatment of the soil necessary for each crop
13. Disease, weed, and insect control
14. Harvesting the crops
15. Canning and freezing surplus produce
16. Studying the life cycle of a plant
17. Experimenting to show the effect of fertilizer, moisture, and cold on certain plants
18. Keeping records
19. Propagating plants
20. Flower arrangements
21. Visiting vegetable markets and keeping up with market prices
22. Planning menus, trying new recipes, and preparing meals

Students wrote to the University of Florida General Extension Service for bulletins on vegetables and flowers. They wrote to the Department of Agriculture, and to the county agent for information on gardening. The *Florida Home Garden*, by F. S. Jamison, *Bulletin No. 131*, from the University of Florida and *Annual Flowers* by John V. Watkins, *Bulletin No. 133*, Agricultural Extension Service, were secured and copies were given to each child, to be used at school or at home. All the material necessary for gardening was secured from the county agent and Department of Agriculture.

The first problem was securing a plot of ground which could be used for the garden. The year before all of the open space on the school ground had been developed into playgrounds. The plot formerly used by the agriculture class was grown over with pines and thick undergrowth. The plot was not fenced and heavy machinery and hard work were necessary to clear it. A look around revealed a field adjoining the school ground. The field had been planted in a summer cover crop which had been turned under. At the time there was no crop growing in the field. The children made inquiries at home and in the community and found that the property was owned by a good friend of the school. A committee of students interviewed the owner and received permission to select their plot anywhere in the field.

Being able to select a plot from such a large area gave the children first hand experience in selecting a suitable site for a garden. After making soil profiles at various places in the field, and considering the criteria for locating a garden, a fertile plot was selected. The plot

was located so that it would not interfere with the cultivation of the main field.

As soon as the location of the plot was selected soil samples were taken and sent to the county agent for analysis. The tests showed that the soil was slightly acid but needed only moderate applications of lime where carrots and beets were to be grown. Plenty of manure with the addition of superphosphate was recommended.

Available equipment for preparing and cultivating the soil had to be secured. Inquiries at home and in the community were made by the students. One parent offered the barn yard manure that was needed and a truck to haul it; another offered the use of a tractor and harrow; another offered a mule and plows when they were not being used on the farm; and two garden plows and necessary hoes and rakes were secured. With this equipment the group decided that they could prepare the soil with a tractor, lay off the rows with a mule and plow; but that they would depend primarily upon the garden plows and hand tools for cultivation. On two occasions the children improvised their own equipment. Once they used a heavy crosstie, which had been given the school to build a cattle gap, to level the ground in the garden. Again when the boys were unsuccessful in laying off straight and uniform rows they built a marker out of strips from a near by saw mill.

Only one more problem, what to plant, had to be decided upon before the size of the garden plot could be determined. From "Florida Crops, What and Where to Plant" by T. V. Brooks, State of Florida, Department of Agriculture, Tallahassee, Florida, information about when to plant the vegetables and the length of time required for maturity was obtained. The same information about flowers was found in *Bulletin 133*. Vegetables and flowers to be grown throughout the year were selected. Crops which could not be harvested by the first week of June were not considered. After consulting with the agriculture teacher from a nearby school and with growers in the community, the class decided to plant ten vegetables and ten flowers. A plot one hundred feet long and one hundred feet wide was decided upon. More space was devoted to the growing of vegetables than to the growing of flowers. The children measured the plot. It was located far enough away from the woods so that the shade and roots of the trees would not interfere with the plants. It was decided to run the rows across the slight slope to prevent erosion.

Much time was spent developing a well-planned chart of the garden showing what, when, and where each crop was to be planted, and the distance between the rows.

The ground had already been turned so the first thing to do in preparing the soil was to spread the well-rotted barn yard manure over the garden. One boy harrowed the ground with a tractor; the rest of the boys raked and the girls picked up sticks and Bermuda grass. They were still dissatisfied with the appearance of the ground. One boy thought of the idea of dragging the surface with a crosstie to level it. The results obtained after this procedure were satisfactory. The soil was again reworked to get it free of sticks, weeds, and Bermuda grass. It was now ready for laying off the rows. All of the boys tried but none were successful in laying off straight uniform rows. A string was tied between two stakes located at opposite ends of the garden. With the string as a guide for the first row, an improvised marker was used to mark the lines for the rows. This time the results were satisfactory. Rows were prepared for planting according to the crops to be planted. The garden was ready for planting by the middle of October. Throughout the entire year the children followed the chart which they had planned.

Measured in terms of growth in practices and attitudes the school garden was a success. Some of the outstanding results were:

1. School was more interesting.
2. The children, parents and teachers had a feeling of pride in their accomplishment.
3. A feeling of interdependence between the school and community was established.
4. The quality of school lunches and food habits of the children improved.
5. The school environment, both inside and out, was more attractive.
6. All of the children were growing either vegetables or flowers at home.

7. Valuable techniques and skills in gardening were learned and practiced.
8. The need for careful planning and wise management was understood.
9. A knowledge of resource people and of materials was acquired.
10. Interest in improving the environment had spread into the homes and community projects.

Down to the Seashore

Joan Woods, Leon High School, Tallahassee, Florida

The study of marine life, in the average classroom, has unfortunately consisted of a superficial shell collection, textbook descriptions of the animals and plants, and rote memorization of phyla and classes. Opportunity for study of marine life in Florida and other coastal states is vast. The added learning experiences which accompany such a healthful and interesting study are numerous. The following suggestions and techniques are an endeavor to rectify our past omissions and to help the teacher and pupils enjoy life in the sea and on its beaches.

Collecting the Animals and Plants

The ideal situation for collecting animals and plants from the water is to have a boat which can pull either a dredge or trawl from behind. Many plants and animals are brought inshore by wave action, and by taking advantage of low tides beachcombing can become more meaningful to a group of students. Tide data may be obtained from "Tide Tables, East Coast, North and South America," published yearly by U. S. Department of Commerce Coast and Geodetic Survey, *Serial No. 742*, U. S. Government Printing Office, Washington, D. C.

Many animals such as the fiddler crab, hermit crab, sand dollars, tube worms, and mollusks may be dug up on the beach with a shovel or trowel. Tidepools yield crabs, snails, small fish, and algae. Buckets with glass bottoms may be used to cut down the surface reflection of the water and reveal the life beneath, while dip nets are used to secure the desired specimen.

The specimens may be preserved in a 5% solution of formalin (1 part of formalin to 19 parts sea water). Fresh water should not be used if the animals and plants are collected from salt water.

Many specimens may be preserved in a single gallon jar and later distributed to smaller containers, a single specimen to a container. Labels written with India ink may be put into the formalin solution with the specimen. Large and scaly animals may be injected with a hypodermic needle, or the body cavity may be slit with a razor blade to allow the inner parts of the animal to be preserved.

Formalin is poisonous and should be handled cautiously; care should be taken to keep the live specimens free form formalin as the smallest amount will cause death. This may be prevented by writing "Live" on all containers used for keeping live material.

How to Make an Aquarium

Five-gallon water bottles (carboys) may be obtained from companies supplying soft or mineral water to homes and offices. One-gallon mayonnaise jars may be obtained from school cafeterias or restaurants.

1. Remove the stopper from the bottle and clean well. At the desired level for the top of the aquarium make a straight line around the jug with a triangular file. File over the line several times.
2. Fill the jug with tap water to the *filed level. Do not leave the stopper in the bottle.*
3. Wrap six turns of grocery string around the jug *one inch* below the filed level.
4. Using a piece of cotton, soak the string with wood alcohol.
5. Light the string with a match. *Stand away from the bottle.*
6. When the fire has burned out and the glass has cracked, lift off the top.
7. When the edge of the glas is cool, the rough edge may be evened with a file and smoothed with emery or sand paper.
8. In the event the glass of the aquarium cracks it may be sealed and used for a terrarium.
9. The top of the bottle may be used as a top for the aquarium if desired. The rough edge may be filed and covered with adhesive tape or prevent slipping.

Preparing the Aquarium

Sea water should be collected about one week before the aquarium is prepared. This

should be placed in a dark room to prevent the growth of algae, which multiply in sunlight. The time lapse is to allow the bacterial population to reach its maximum and return to normal. When sea water is transferred to an aquarium there is more solid surface available (sides of the aquarium) on which the bacteria become established and multiply.

It is important that numerous gallon jars are available during the collecting. If the number of animals is limited to one for each gallon jar the chances for survival of the animals are much greater. Animals to be preserved may be placed in a single container.

Many youngsters have rubber face masks and flippers for their feet and may do some underwater exploration and collecting. The importance of water safety should be stressed if this method is employed. The following topics are suggested for study:

1. Water pressure as related to caisson disease.
   a. Sponge divers.
   b. Professional diving equipment principles.
2. Survey of harmful beach and sea animals and how to handle such specimens.
   a. How and why the jellyfish sting.
   b. What is the Portuguese-Man-War.
   c. Sharks, sting rays, electric fish.
3. The danger of diving into unknown waters, sandbars, and hidden debris.

It is wise to have a field guide on hand during the collection so that the animals may be identified and studied. E. Lawrence Palmer's "Fieldbook of Natural History" and Buschbaum's "Animals Without Backbones" are excellent for this purpose.

About a week after the sea water has been collected, the aquarium is ready to be set up. The steps are as follows:

1. The sand which is collected from the beach should be washed in a bucket with clear tap water three or four times. If you are desirous of learning something about the organisms present in the sand, the sand should not be washed.

2. After all debris has been removed and the sand is clean, place approximately 1½ inches of sand in the bottom of the aquarium.

3. Place a piece of waxed paper on the sand and pour the sea water onto the paper so as not to stir up the sand. Fill the aquarium to within 2 inches of the top. Another jug of sea water may be held on reserve in a dark place. In the event of death in the aquarium, all living animals should be removed and placed in clean sea water. It is for this reason that a reserve jug has been kept. The water in which the animal died may be strained through a filter paper or paper toweling and used again.

4. Mark the water line on the outside of the aquarium. When evaporation occurs, distilled or rain water may be added. Sea water is not added because only the water has evaporated and the mineral salts remain in solution. Adding salt water would increase the salinity and be fatal to the animals.

5. Plants are not essential to a marine aquarium. Most plants are undesirable because they decay and increase the bacterial population. Contrary to accepted beliefs a relatively small amount of oxygen is supplied to an aquarium by plants. A greater amount is obtained through the surface of the water. However, to enhance the beauty of the marine aquarium a small piece of algae, as Ceylon Moss, may be added. This algae may be found washed up on the beach at low tide. For other types of algae refer to E. Lawrence Palmer's "Fieldbook of Natural History."

Stocking the Aquarium

In a five-gallon aquarium one or two 2-inch animals will live successfully. For instance a sea horse and a sea pansy. In a one-gallon aquarium only one 2-inch animal will live successfully.

If a sea horse is used a stick wedged against the sides of the aquarium and completely submerged should be added, since the sea horse clings to objects by its prehensile tail.

We found that a marine aquarium could be maintained for three or four weeks without changing or filtering the water, or without adding oxygen by aeration methods. If there is a high rate of death among the animals it may be due to the fact that care was not taken in handling and transporting the animals. If the aquarium animals live for only a few days this is still a worthwhile endeavor. The value of studying the animals from life is great. For school use it is not practical to have a marine aquarium year round.

Suggested Activities

Making a Permanent Shell Collection

Everyone who goes to the beach returns

with some relic or prize as a remembrance. All youngsters enjoy collecting shells but few have developed a desire to preserve, exhibit, and study these shells. Collecting shells could be a valuable learning experience for the students.

Few students know about the living animal which produced the shell. It is possible to obtain many living specimens and draw the animal out of his shell for the students to see. This is accomplished by placing the specimen in a small flat container filled with sea water. To this water a weak solution of Epsom salts is added gradually. The Epsom salts solution acts as a relaxing agent and draws the animal out.

The exterior of the shell may be covered with parasites and sea scum which conceals its natural luster. This may be removed by dipping the shell in a weak solution of acid or by washing it with Chlorox. Chlorox, however, is a bleaching agent and the shell may be more valuable for study in its natural state. The shells may be made to shine by rubbing them with a silk cloth after they have been cleaned. The importance of an odorless collection should be stressed.

One of the most successful and lasting ways of mounting shells is to fill the shells with cotton and glue the cotton to a piece of plyboard. This makes an attractive and permanent collection.

Shells should be grouped according to their shape because the same species of animal live in them. Only the variety and environment cause the variation in color of the individual specimens of the group. Roger Tory Peterson's shell guide may be used as an aid in classifying the shells.

Through such an activity worthwhile and enjoyable hobbies may be inspired which may last a lifetime.

Mounting Algae for Study or Decoration

Algae which are collected on the beach or in in the water are often thrown away or allowed to dry in a disheveled heap. They may be preserved by mounting it on herbarium paper. This is considered an art by botanists but is not beyond the skills of high school students or even elementary students.

The equipment needed consists of one large pan, such as the bottom of an oven-broiler; sheets of herbarium or index paper, which may be secured from small printing offices; waxed paper, blotting paper; newspaper; corrugated paper; and cement blocks.

1. Fill the pan with sea water.
2. Completely submerge the herbarium paper, previously cut to the desired size, in the water.
3. Arrange the algae on the paper. A pin or pointed stylus may be used to arrange the algae. For study, one species of algae should be pressed on one piece of paper. However, for decoration several suitable types may be pressed together.
4. When the algae is arranged satisfactorily, slide the paper with the algae on it out of the water.
5. Place a piece of waxed paper directly upon the algae.
6. Place this within the fold of a newspaper.
7. Place a piece of blotter paper on each side of the newspaper.

   Note: When blotters are wet, they should be dried and replaced.
8. On the top and bottom place pieces of corrugated paper, cut to the size of the herbarium paper.

   Note: Following the preceding steps a number of specimens may be pressed at the same time.
9. Place all of this under cement blocks for one week.

The finished product will appear to be painted on the paper. With careful handling the algae will remain attached to the paper indefinitely. No glue is needed. The nature of the herbarium paper and the algae itself blend as one. These mounts may be identified and labeled making a permanent classroom collection. In the lower grades decorative mounts may be taken home by the children as gifts on holidays.

The algae may be preserved in formalin along with the animals prior to the pressing. In identifying the algae E. Lawrence Palmer's "Fieldbook of Natural History" is an excellent guide.

Collecting Plankton

Techniques in microscopic study may be taught by using plankton. Plankton includes

any floating material found in the sea. Larval stages of animals, jellyfish, protozoa, algae, and microscopic plants are collectively termed plankton. Plankton is the basic food of animals from the simple sponge to the largest mammal, the whale. It is said that a whale eats tons of plankton in one day. To the ancient mariners, plankton soup was a delicacy. It is also a delicacy to present day populations in parts of China and the Arctic.

An accumulation of plankton may be obtained by pouring buckets of sea water through the foot of a woman's nylon stocking. Other materials are too coarse and the minute organisms strain through.

When approximately one teaspoonful of solid matter has accumulated in the toe of the stocking, turn the stocking wrong side out. Wash the contents of the stocking into a *small* jar of sea water.

Because plankton lives only a short while when taken from its natural habitat and concentrated into a small area, study through a microscope should be done immediately. However, it is worthwhile to observe the plankton with a microscope even if the plankton is dead.

After the students have had an opportunity to observe plankton it may be preserved by adding, to the sea water, enough formalin to make a 5% solution.

If the ocean or Gulf of Mexico is accessible to pupils of the school, the study of zoology may be made more valuable and enjoyable by either taking the class to the sea or by bringing the sea to the classroom. In this way we can teach basic techniques, stimulate artistic abilities, and actually observe the things hitherto merely *labeled, classified,* and *forgotten.*

Since the majority of the earth's surface is covered with water and more than half of this is salt water, wise use of this plentiful resource should certainly include a study of the life which lives in it.

The 1953 March of Dimes

Polio incidence is getting worse in about the same percentage that the *March of Dimes* research is getting better. During 1952, about 55,000 cases were reported. This was a 100% increase over 1951, a 33% increase over the previously high year of 1949, and a 100% increase over the 1947–1951 five-year average. Of the 55,000 patients, some 7,000 had to be helped by iron lungs during some part of the year. This worst epidemic of all time was met squarely by the communities taking part in the 1952 *March of Dimes* campaign.

The 1953 *March of Dimes* is now under way. *The American Biology Teacher* trusts that all biology teachers are using their influence and energy to help. Biology classes offer unusual opportunities to bring out the basic relationships of research and disease control. Polio has recently been described as the only epidemic disease still on the increase in the United States. This is a problem for all students and all teachers, but particularly so for those in biology classes.

Take part in the *March of Dimes!*

The New England Biological Association

The New England Biological Association met at the University of New Hampshire, October 25, where Dr. George M. Moore showed an excellent colored film—*Marine Life at Wood's Hole*—taken by George Lower of Westtown, Pennsylvania. Some of the pictures of scallops swimming, comb jelly fish and Portuguese men-of-war moving about were unusual.

In the afternoon, Dr. A. F. Yeager took the group through the greenhouses and showed them the many successful results of their plant breeding experiments.

On December 13, there was a meeting of the NEBA at Boston College, where Mr. McCarthy spoke on biochemistry, Dr. Michael Walsh gave his new concept of the cell, and Mr. Ryan enumerated some factors of resistance in bacteriology.

In March there will be a meeting of NEBA at Deaconess Institute of Cancer Research, Boston, Massachusetts, and in May there will be another meeting, at Hartford, Conecticut.

MABEL A. POTTER,
Regional Chairman, NABT

THE CHANGES IN THE JOURNAL have apparently met with general approval, judging from the letters received and the comments made at the meeting. Only one unfavorable letter has been received; the author (name withheld on request) said he thought it was silly and that he would have to develop a new set of behavior patterns after all the years of looking at the table of contents right on the front page where it was handy.

FIG. 1. A mineral nutrient solution can be prepared by dissolving $2\frac{1}{2}$ teaspoons of Epsom salts, $\frac{1}{2}$ teaspoon of ammonium sulfate, 4 teaspoons of calcium nitrate, and $1\frac{1}{4}$ teaspoons of monobasic potassium phosphate in 5 gallons of distilled water.

Try a Hydroponic Garden

CHARLES A. GODDARD, Biology Teacher, Chaffee High School, Chaffee, Missouri

For general interest and pupil motivation; for the ultimate in experimental control; for simplicity with many scientific facts understandable to slower pupils; for a limitless number of original lines of research to challenge more brilliant pupils; for a constant supply of readily observable plant structures, living and performing their normal functions; try a hydroponic garden! There is no need to delay using this valuable teaching tool; there is no justification for the general fear that a vast amount of work is involved, much time is needed, or rare and difficult technical knowledge required.

"Soilless," "hydroponic," or "chemical" culture of plants, as it is variously called, presents three basic problems: (1) mixing required mineral solutions; (2) supporting the plants in an erect position; (3) providing for regular "feeding" of the right amount of mineral solution. Exactness is not too important in mixing the mineral nutrient solution; a number of chemicals have been used to provide the needed materials in proper proportions. Also, the cheapest grades of the chemicals obtainable should be used because these usually contain rare elements, needed only in trace amounts, as impurities which would have to be added separately if more expensive analytical reagents were used.

However, too great a variation from the amounts specified, as teaspoons (Tsp.) per five gallons in Fig. 1, will kill the plants. This photo shows the dry chemicals in the amount and order in which they should be dissolved in distilled or rain water to obtain five gallons of nutrient solution. Tap water can be used if not extremely high in minerals, or if allowance is made by using less of those minerals known to be in the tap water.

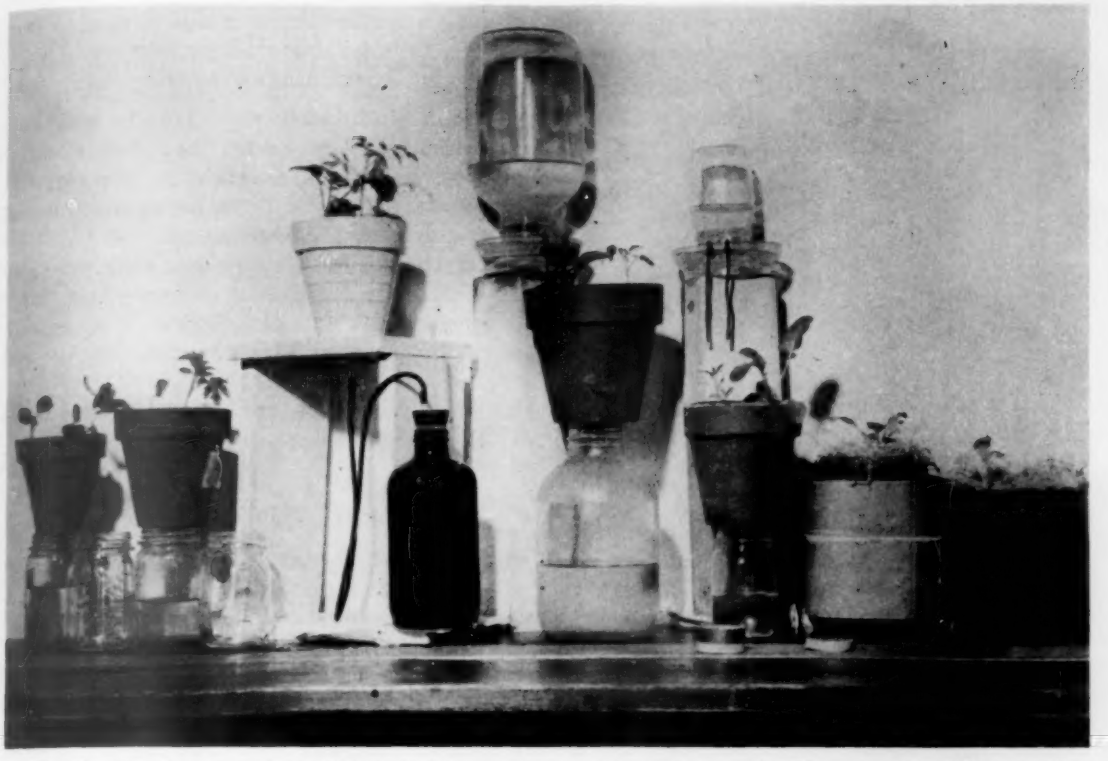

FIG. 2. The first two plants (left to right) are supported in washed sand. The mineral nutrient solution is poured twice daily over the sand and allowed to drain into the jars beneath. The third plant is supported in gravel and "fed" twice daily by raising and inverting the bottle of mineral solution until the liquid appears above the surface of the gravel. The fourth and fifth plants are supported in washed sand, and receive the mineral solution along bent pipe-cleaners hanging from chicken-watering devices. The sixth and seventh plants are supported in trays made from chicken wire filled with "wood wool," and the trays are lifted several times daily to aerate the plant roots.

FIG. 3. Nancy Ebbs and Helen Thornton measure and record the height of their plants each day, and try to explain variations among plants grown by different methods. They found that the "drip" method of sand culture gave the fastest growth among all the methods they tried.

Fig. 2 shows how one Chaffee High School biology class solved the problem of supporting the plants, and of providing regular "feeding" of nutrient solution. Tomato, radish, and lettuce plants were started in regular seed flats, and transplanted to the soilless garden. Accurate measurements of rate of growth, and careful recording of observations made of plants grown by various methods (Fig. 3–4), may complete the scientific education benefits to be derived from the project. Interest is maintained by the pleasant competition which always develops among members of a class and, when the "crop" is ready for "harvest," the pupil who grows the first tomato or the largest radish (see cover picture) will be as

FIG. 4. Charles Hughes, champion tomato-grower, measures a tomato plant when the first blooms appeared 93 days after start of the experiment. He used the sand-supported, drip "fed" method.

much of a school hero as the quarterback who throws the winning pass!

REFERENCES

(in order of difficulty)

1. *Soilless Gardening*, a booklet in Science Fundamentals Soilless Gardening Kit, Science Service, Washington, D. C.
2. *The New Garden Encyclopedia*, Wm. H. Wise & Co., Inc., New York.
3. *Soilless Growth of Plants*, Ellis and Swancy, 2nd Ed., Reinhold Pub. Corp., New York.

Letters

Dear Mr. Breukelman:

Elmer and Bob are overjoyed at the prospect of appearing on a magazine cover eating hydroponic radishes. They're already fighting over who gets my copy of the January issue—which I have no intention of parting with under any condition!

How can I obtain extra copies for them without robbing a couple of friends who claim they keep a file of their ABT magazines for reference?

Now for the information you requested:

1. Who took the picture?—I did. In addition to teaching Biology in the local high school, I sponsor a school camera club, and am held responsible for making or having made enough snapshots for the school annual.
2. On what kind of film?—Kodak Verichrome.
3. With what kind of a camera—Zeiss Super Ikonta BX.
4. At what exposure?—Synchronized flash bounced from low ceiling. GE 22 flash at f/22.
5. Where was the picture taken?—In the Chaffee High School biology classroom.

Sincerely yours,

CHARLES A. GODDARD,
Biology Teacher,
Chaffee High School

Dear Mr. Breukelman:

Sincere congratulations on your new edition of *The American Biology Teacher*. The front cover picture adds immensely to the "new look" of the magazine. I enjoyed reading articles of real classroom experiences, but I miss the shorter "ideas" column . . . .

Sincerely yours,

SISTER M. GABRIELLE, O.S.F.,
Pittsburgh, Pennsylvania

. . . the best magazine I receive. How about a page of condensations of most recent biological developments?

RICHARD P. BALDWIN,
13 New Jersey Avenue,
Bellport, L. I., New York

Dear Sir:

. . . I need some information in organizing a biology club at the high school in which I teach. Can you furnish me with information such as: organizing the club, dues (if any), free materials and low cost materials, magazines suitable for programs . . . .

Very truly yours,

R. C. CAINE,
404 Irwin Street,
Athens, Alabama

Editor's Note: Will anyone who has had recent experience in organizing a biology club and wants to share the experience please write to Mr. Caine and give him some help?

Dear Dr. Breukelman:

I have here an item that should be of interest to biology teachers. Details will have to be supplied later.

"The Chancellor of the Georgia State University System has recently set up an Advisory Council Committee on Biological Sciences. This committee of 17 members is made up of one professor of biology from each of the state's 15 units with an extra member each from the State University and the Georgia Institute of Technology . . . will report on personnel and organization at a later date."

CARL J. KUIPERS,
Middle Georgia College,
Cochran, Georgia

NEW OFFICERS

The results of the election of officers of THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS for 1953 have been received from the Secretary-treasurer. The elected officers, who have assumed their duties as of January 1, 1953 are as follows:

President: Leo F. Hadsall, Fresno State College, Fresno, California.
President-elect: Arthur J. Baker, Crystal Lake Community High School, Crystal Lake, Illinois.
First Vice-president: Lydia Elzey, State College, Pennsylvania.
Second Vice-president: Brother H. Charles, Saint Mary's College, Winona, Illinois.
Secretary-Treasurer: John P. Harrold, Senior High School, Midland, Michigan.

The new president holds his Bachelors and Masters degrees from Bucknell and his Ph.D., in science education, from Cornell, where he was a Charles Lathrop Pack Fellow in Nature and Forestry Education. He is a member of Sigma Xi and Phi Delta Kappa, as well as a large number of scientific and educational societies, including NABT. He taught in elementary and secondary schools in Pennsylvania and New Jersey, and has been teaching biology at Fresno State College, Fresno, California, since 1932. He is currently teaching at Cornell University. He has been a summer session teacher at Sierra Summer School, St. Cloud, Minnesota, Teachers College and the University of California. He is the author of numerous articles in scientific and educational journals, including *The American Biology Teacher*. He has done research in many phases of nature study and ecology, and is a member of the California State Conservation Council.

Biographical sketches of the other officers appeared on pages 153–155 of the October 1952 issue. All of them have been active members of NABT, having served on many different committees and taken part in many activities. All of them are leaders in biology teaching and science education in their respective areas. All of them have shown the breadth of interest that enables them to see the long range problems of science education as well as the day-to-day problems of the classroom. The editorial staff of ABT extends the new officers sincere congratulations and wishes them a happy and constructive year.

STUDENT COPIES of many recent issues of *The American Biology Teacher* may be obtained at fifteen cents each. Write John P. Harrold, 110 East Hines Avenue, Midland, Michigan.

Classroom Procedures in General Biology

ELMA W. MCCONNELL, Atlantic City High School, Atlantic City, New Jersey

Changes in school population and recent trends in general education have developed in some secondary schools two courses in biology. One course is for the student going to college and a second course, general biology, is for the non-academic pupil who may or may not graduate from high school. Biology contains much useful knowledge for these non-college pupils. The subject matter and the methods need to be adapted to the individual groups and to the specific interests of the locality in which they live.

SUBJECT MATTER

Selection of the topics requires experience with general groups and will vary from year to year. Some topics that have had the most universal appeal over a period of years are physical health, mental health or elementary psychology, disease control, reproduction, foods or nutrition, and heredity.

The factor of prime importance is to develop interest by using material related to the pupils' personal everyday life, and to devise

methods of helping them to learn and to express their knowledge. It is not the *amount* of subject matter but the *pertinence* of its application to their lives that requires first consideration for the best results. As A. E. Holch [1] states, "Our aim should be a few well-selected facts, well learned." This gives the pupil the most satisfaction.

Creating Interest

To adapt the work to the individual presents a problem. Some of the pupils have average and others above-average ability, but the greater number are slow-learners with a physical, psychological, or mental handicap. The first requisite is to *sell* them biology. Living specimens are the most certain way to attract attention.

In September there is an abundance of flowers, insects, amphibians, and fresh- or salt-water animals in the local environment. Specimens brought in the first day of school, and brief explanations by the teacher, will lead to closer examination of the environment for others and increase the collection. These placed around the room with written labels and notes begin the biology museum for the year. If well-marked reference materials are placed near the collection, the pupils can find the answers to their inquiries and develop a pupil-directed class discussion.

For those who have not been attracted by this display, magazine and newspaper articles can give them a clue to a hidden interest in biology. Meantime the teacher can become acquainted with the individual pupils, their abilities, and their preferences.

A roll call, at which each pupil gives a few minutes talk on a specimen or current biology article, will draw all members of the class into participation. Activity by every member is essential in this heterogeneous group. Very often the slow-learner is either too reticent to recite or too talkative to listen to others. Each type needs to contribute in turn in order that the group be assimilated into a working unit.

[1] Holch, A. E. Combining Thoroughness with Conservation of Time in Teaching Biology and General Science. *The Science Teacher*, Vol. XI, No. 4, pp. 20–21, 42–43, December 1944.

Aids for Reading Difficulty

In reading reference material or the textbook, the non-academic pupil encounters a problem. Mallinson, Sturm, and Mallinson, in their article entitled *The Reading Difficulty of Textbooks for High School Biology*,[2] state, "Textbooks are likely to be quite difficult for below-average ninth graders to read, are likely to cause some difficulty for the average ninth grader, but are not likely to be difficult for superior ninth graders except for certain difficult passages."

If, at first, the difficult passages in the reading assignment are read aloud in class and new terms explained, the pupil can continue the reading with greater understanding. Further assistance is given the slow reader by having a series of questions which directs his attention to the main thought of the paragraphs. This stimulates his thinking and helps him discriminate between important facts and minor details.

Comprehension of scientific terms and correct spelling is improved when a vocabulary list of new words is made and drill given on the division of words into syllables, the pronunciation, and meaning. The drill emphasizes the accuracy desired in science and aids the pupil in overcoming word difficulty.

Varied sources of reading material relate the work more closely to everyday experiences. Articles from science and non-science magazines contain useful biological knowledge. If the pupil finds reading material in magazines or newspapers in the home, the biology course can create interest to carry over into later life outside of school. In all correlated reading, the fact that science seeks the truth needs to be stressed. Pseudo-science, exaggerations, and science fiction must be distinguished from true scientific facts. The latter stimulates the imagination and the former produces working knowledge.

Variations in Procedures

Non-academic pupils are more interested in life outside of school, and have a short in-

[2] Mallinson, G. G., Sturm, H. E., and Mallinson, L. M. The Reading Difficulty of Textbooks for High School Biology. *The American Biology Teacher*, Vol. 12, No. 7, pp. 151–156, November 1950.

terest span. To maintain continued class activity, and individual learning, variety in classroom procedures is necessary.

Methods in High School Biology, by Arthur H. Bryan,[3] describes twelve different plans. *Selected Procedures in Teaching Biology,* by Irene Hollenbeck and Elmo Nall Stevenson,[4] contains many novel class procedures.

To motivate pupils to the maximum of their ability requires careful planning for the more rapidly moving learner and the slow learner. A list of related topics for extra credit work, a work sheet of minimum and maximum questions, or suggested individual projects will direct the rapidly moving learner. Oral reports of this work will broaden the experience of the slow learner.

Use of Audio Visual Aids

The slow learner requires many aids to understand biological principles. He comprehends things which he can hear, feel, see, or smell, but not problems requiring abstract thinking. Through the use of sensory perceptions and abilities, mechanical or artistic, the pupil will derive satisfaction and knowledge by the making of models and charts. Standards of accuracy in relation of parts and scale of related parts of the models requires reading and understanding of life functions.

Experiments started in class and continued at home are an excellent way of using visual material. Every pupil responds to the growth of a seed into a new plant. After the bean is studied in class, each pupil can grow a seed on a blotter and make daily records of its growth. Questions regarding the success and failure of the seeds may then form the basis of class discussion. Thus experience with a problem of growth makes biology live.

Professional and student-made models and charts, filmstrips, motion pictures, and living specimens play a large part in the learning of general biology groups.

[3] Bryan, Arthur H. Methods in High School Biology. *The American Biology Teacher,* Vol. 10, No. 7, pp. 179–183, November 1948.

[4] Hollenbeck, E. Irene, and Stevenson, Elmo Nall. *Selected Procedures in Teaching Biology.* Oregon State College, Corvallis, Oregon—College Press, 1950.

Evaluation and Conclusion

Teaching of the general courses calls for the best teaching methods to prepare these future citizens of a democracy. Actual evaluation of the success of such a course is difficult. The testing program may give tangible evidence of the facts learned but the intangible values, such as the relation between teacher and pupil, the carry over value, the actual use of facts learned are hard to measure.

Often pupils' written opinions at the end of a course give some opportunity to evaluate and to modify procedure. Return to students with biological material long after the course is over shows continued interest. Such incidents indicate certain values that are not measured by a testing program.

These are only a few of the many possible plans and procedures useful to the general biology teacher. There is need for more research to determine how biology may be developed for practical values in general education.

Summer Vacation is not far off, as an editor sees it. Any articles, programs, announcements or other notices concerning summer camps, workshops, field trips and the like should be sent to the editor as soon as possible. Manuscripts intended for publication in the May issue will be sent to the printer soon after the first of March. Anything received ofter that time must be fitted in on a catch-as-catch-can basis.

Here are two "Biology in The News" items for which there wasn't enough room in the regular column (page 21).

A College Course on National Parks, *National Parks Magazine,* Oct.–Dec. 1952, pp. 180–.

An article for teachers who wish either to enrich their courses or to lay plans for their next vacation tour. (Thanks to A.R.G.)

World's Most Amazing Mail Order House by Don Morris, *Pageant,* Nov. 1952, pp. 101–107.

Your students may enjoy reading how General Biological Supply House collects and retails the many items needed in our laboratories.

The Use of Drawings in General Zoology—A Survey

Raymond Greb, Associate Professor, Entomology-Zoology Department,
South Dakota State College of Agriculture and Mechanic Arts, Brookings, South Dakota

Students in courses in General Zoology are usually asked to examine a series of animal forms. Drawings of the animals examined are used by the students to aid in the study. Whether the course is taught with emphasis on the principles of animal structure and behavior, or whether it is taught from a systematic point of view, the problem of how much time should be devoted to making drawings is an irksome one. Correcting drawings and evaluating of drawings for a grade are additional problems that confront the laboratory instructor.

Many views are held by zoology instructors regarding the value of drawings in the freshman courses. Some of these may be listed:

1. Drawings serve as the best "third eye" in studying animals.
2. Drawings are a means of showing the instructor that parts of relationships of structures of an organism have been seen in the patterns depicted by the drawings.
3. Drawings serve as training toward exact observation by forcing the student to examine carefully in order to be able to draw.
4. Drawings are used as a descriptive language. The pictorial language relays concepts much more accurately than can any written word.

Some of the objections raised against the use of drawings are:

1. It takes too much time to complete a drawing; more could be accomplished by observation and discussion without the drawings.
2. Many students are unable to draw and hence cannot pictorially relay ideas of structures or relationships.
3. Structures may be erroneously depicted and hence not learned correctly.
4. It may lead to over-emphasis on drawings and perhaps to a certain amount of intellectual dishonesty.

Some schools use prepared outline drawings. Such outlines are completed simply by labeling. In some cases a few details are added by the students.

The purpose of this report is to present an analysis of a recent survey of colleges and universities over the country regarding the drawings problem. The writer has always felt that good drawings should be an integral part of a course in General Zoology. He was not supported in this view by some of the other members of the department at South Dakota State College. It was decided to make a survey of some of the leading colleges and universities, which maintain high standards in teaching General Zoology, regarding the matter of use of drawings. Inquiries were sent to schools in the East, South, and West in an effort to get a reasonably fair cross-section of the opinion of zoologists on this point. One hundred and fifty letters were addressed to Chairmen of the General Zoology courses. One hundred and eighteen replies were received.

One may conclude on the basis of the response that drawings are still regarded as a desirable adjunct of zoology courses in most schools over the country.

In the latter cases, comments indicated that the more complex drawings were always furnished, and that the simpler structures were drawn free hand. Well over one-half of the schools use no prepared outline drawings and a relatively few schools supply all drawings used.

Some typical comments, indicative of the opinions of Zoologists regarding drawings, follows:

Carleton College: "Drawings are checked for accuracy only. It is for the student's later study and not 'busy work' imposed by the instructor."

Harvard University: "We go on the philosophy that the animal itself is far more significant than any 'map' on paper."

Eastern Illinois State College: "I have long been interested as to the value of drawings. I once

tried to teach a class with observation and study but without drawings. It was a failure. I tried handing out drawings to be labeled and had better, but poor success. We try very hard to emphasize scientific accuracy and de-emphasize art, shading, etc. With my method of teaching this seems by far the better method. I suppose this is based on the old Agassiz statement that 'a pencil is the best third eye.' I am not sure that this is the best method for all instructors."

Tulane University: "We do not use the drawing as a work of art, but as an aid in seeing that the student understands and correctly interprets his specimen."

University of Illinois: "We feel that illustration of things observed is definitely part of a scientific approach, but it is not an end in itself and is emphasized no more than, say efficient use of the microscope or accurate dissection."

University of California: "While drawing is not stressed as an end, we consider it an important part of adequate note-taking."

University of Minnesota: "We urge students to make sketches in laboratory, but they are not required."

University of Tampa: "I like outline drawings for specimens given minor emphasis. Nothing can take the place of close and accurate observation and faithful, well-labeled drawings."

Rockford College: "We feel that there is little value in drawings that are already prepared and just have to be labeled. The student can label without looking at the specimen. We also feel that too much emphasis on the detail of drawing technique is unwise because of the amount of time used for mechanical work. We have not been able to make students really *look* at materials carefully without requiring some drawing (or a test), since they are not trained in observation."

Summary

Quite contrary to this writer's concept regarding the eminence of drawings—it may be pointed out that many outstanding laboratories over the country do not insist on drawings to the extent that was anticipated. While over half of the replies received indicate that students do have drawings, and also indicate that most laboratories expect their students to make their own sketches, they indicate equally forcefully that many laboratories do not stress accurate drawings in General Zoology. If one may foresee a trend, the detailed and accurate drawing of specimens studied, as a part of the laboratory procedure, is being de-emphasized. Similarly, outline drawings, while never in wide favor, are being more widely recognized as "busy work." General Zoology instructors feel that much time is wasted in simply labeling outline drawings.

Only line drawings, reduced to a minimum, with little attention to the mechanics of acceptable biological illustrations, still are encouraged in many schools.[1] In a few instances, one or two "publishable" drawings are being required simply for the practice, and also as a basis upon which a student will be able to interpret a reasonably good published drawing.[2]

Perhaps this trend is due to the rise in the use of films, slides, and the more copious use of drawings in textbooks. Modern text-figures are much better now than they were in the older texts in illustrating structures, relationships, and details. Many diagrammatic views are used to bring out certain details or principles. Models, charts, and much better preserved specimens may also be factors in minimizing the need for drawings in a general course. In studying well-injected specimens, a student is able to correlate structures and find many details that his counterpart of 25 years ago was unable to find.

Perhaps, if we are to make the most economical use of the abbreviated time allotted to laboratory work in General Zoology we may, for the present, continue to insist on a limited number of drawings of some of the more difficult things to get across to students. This writer still believes that drawings do "encourage" the students with less initiative to look more closely at structures. Drawings have in the past and will continue to illustrate

[1] Many instructors insist that too much time can be diverted to techniques and mechanics. A very small number, however, still adhere rigidly to "good techniques" of drawings. It becomes apparent that placing a value as a fraction of the final grade upon the drawings is difficult and not widely practiced. However, some recognition for work accurately and painstakingly done deserves consideration.

[2] One may conclude from the data that more complex drawings are supplied in outline form by many schools. The validity of this procedure is questioned by many others.

to the instructor the degree to which the student was able to observe and the accuracy of such observations. Drawings should still be checked and returned to the student for his use in study. Whether they may be used in evaluating the student's understanding of the subject remains a moot question.

STUDENT TEACHERS AND DIRECTORS of Student Teaching in Biology: Copies of *The American Biology Teacher* are available, either current or recent, at 15 cents each. Write to John P. Harrold, 110 E. Hines Avenue, Midland, Michigan.

Science—A Modern Fountain for Youth*

JOHN D. DODD, Assistant Professor of Botany,
Iowa State College of Agriculture and Mechanic Arts, Ames, Iowa

In my contacts with college freshmen who, after all, were high school students just a few months back, I have come to accept their "Go ahead and teach me something, I dare you" look as a stimulating challenge. None-theless, reasons for the existence of that look cannot be ignored. Nor can one help asking why it is that so many students come to the fountain of science, take a few half-hearted sips, and turn away. What has happened to that bouncing, brash, and wonderful curiosity these same kids had back in the 7th and 8th grades?

I am sure that many high school students feel that "older folks" misjudge them badly. I remember the look on a young man's face when he overheard a comment that, "The youngsters of today are afraid of hard work." The source of this profound observation was a gentleman in a barber's chair. He was peacefully relaxed with a hot towel over his face. Someone was shining his shoes, and his hands were folded comfortably over a magnificent corporation.

Thoughtless remarks like, "No wonder you flunked biology, kid; I never could stand the stuff myself," serve to dull the edge of industry as well as curiosity. Even the best-intentioned parents can help to pull the rug out from under the teacher-pupil relationship by making such comments . . . . Oh well, it is genetically impossible for a child to pick a wise father anyhow.

Then there are some teaching techniques that help to kill curiosity. One is the spoon-feeding system wherein, at a given signal, the student opens his mouth so that a small portion of sugar-coated and pre-digested information can be popped in, carefully, so as not to chip the teeth. This technique does have usefulness, I think, in situations where individual students are falling far behind the class. They get panicky and quit trying. Spoon-feeding may help them through a period of scholastic convalescence. In normal situations, however, it is detrimental to that healthy individualism which is our greatest national asset.

Some of us try to make students interested in soaking up knowledge by holding their faces under water; a pet peeve of college students being "the shotgun quiz" (the professor carries a sawed-off shotgun and no one knows where or when it will go off). I realize that it is a marvellously effective technique, since it scares the students into studying, but is the motive worthwhile?

I realize also, that it is easier to ask such questions than to answer them. And I am going to ask some more, because these are questions that you *must* answer if you are really to make science a "fountain for youth":

1. Is the water in your fountain always clear and sparkling? Do students become thirsty just watching it?

2. Is it free from any taint of bias, boredom, or bunk?

* Excerpts from a talk by Dr. Dodd to the science and mathematics teachers of the Central District of the Iowa State Education Association, April 5, 1952.

3. Is the pressure adjustable, so each student can drink his fill without choking or without becoming disgusted because it flows too slowly?

4. Do you shut off the fountain at four o'clock sharp?

5. Can you accept the fact that most of the water goes down the drain, and console yourself with the thought that the little which is imbibed has important metabolic implications?

6. Do *you* have enough well-springs of information so the fountain never runs dry (I don't mean a lesson plan full of "busy work")?

7. Are you patient with the eager ones who always manage to fall into the fountain?

8. Can you recognize the timid ones who are desperately thirsty but unable to crowd around a busy fountain?

9. And, finally, *do you ever take a little drink yourself, just to see if the stuff is as good as advertised?*

Books

CHESTER, K. STARR. (Translated from the Russian) Selected Writings of N. I. Vavilov, The Origin, Variation, Immunity and Breeding of Cultivated Plants. Chronica Botanica, Vol. 13, No. 1/6, pp. viii + 366. Chronica Botanica Co., Waltham, Mass.; Stechert-Hafner, Inc., New York City. $7.50.

This book is of special interest because Vavilov was the world-famous Russian geneticist who was liquidated in the early 1940's. Before his death he published this work which is a masterful presentation of scientific reasoning, free from political restraint. He credits the method of vernalization introduced by T. D. Lysenko as opening up great possibilities for the utilization of the world's assortment of herbaceous crops. Russian genetics, now dominated by Lysenko, often seems to conform to the ideology of Marx and Lenin.

This volume is divided into five main parts: Introductory Essay, Plant Breeding as a Science, 12 pp.; Phytogeographic Basis of Plant Breeding, 41 pp.; The Law of Homologous Series in the Inheritance of Variability, 39 pp.; Study of Immunity of Plants from Infectious Diseases, 73 pp.; and Scientific Basis of Wheat Breeding, 166 pp. In addition there are 14 pp. of illustrations of varieties of wheat, an Author Index of 4½ pp., and an index of Plant Names, 5½ pp. It is paper bound with 10¼ × 6¾ page size. At the end of each division except the first is a list of literature. Plant breeding is defined as "Evolution directed by the will of man." The chief centers of origin of cultivated plants are listed as Central and Western China, India, Indo-Malaya, Central Asia, Asia Minor, Turkey, Russia, Mediterranean, Abyssinia, South Mexico and Central America.

The book would be of especial value for plant breeders and particularly for those working with wheat.

M. A. RUSSELL,
Junior College,
Highland Park, Michigan

WELCH, PAUL S. *Limnology*. 2nd ed. McGraw-Hill Book Co., Inc., New York. xi + 538 pp. 56 tables, 50 figures. 1952. $8.00.

In 1935, P. S. Welch wrote the first and only limnology textbook that has been published in the United States. The second edition of *Limnology* is now available and it remains the only American published limnology text. The author has retained the original structural pattern, dividing the text into five parts which include seventeen chapters. Chemical, physical, and biological factors that are associated with quality and quantity of life supported in both large and small standing and running bodies of inland waters are stressed throughout the book. Each chapter has been enlarged and revised; the bibliography has been completely rebuilt. There are more than 1500 entries grouped under chapter headings in the bibliography. Journals and bibliographies devoted largely or wholly to limnology are listed, and there is an index. This text, which is actually a pioneering venture in a relatively young branch of biological science, should be of interest to every teacher of biology.

TED F. ANDREWS,
State Teachers College,
Emporia, Kansas

Biology in the News

Have We Missed a Cure for Cancer? by Dr. Benjamin F. Miller, *Colliers*, Dec. 13, 1952, pp. 19–21.

Have we screened all known chemical compounds for their effects on cancer? Should we do so? Dr. Benjamin Miller thinks we should; that the knowledge gained will help relieve other diseases as well.

Carolina's Herb Woman by John Maloney, *Colliers*, Dec. 6, 1952, pp. 28–31.

Herbs and pollen continue to find a place in the diagnosis and treatment of disease. The work of

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Mrs. Lula Miller and her family, who collect for one of the large drug houses, may inspire pupils to become interested in medicinal plants.

The Prairie, pictures by Howard Sochurek, *Life*, Dec. 15, 1952, pp. 116–125.

This group of pictures conveys a distinct feeling of the immense space of the prairie and maybe its lonesomeness. To those who live among trees the bleakness is also apparent.

The Sherburne Story by Keith Hart, *Outdoor Life*, Dec. 1952, pp. 42–43 & 104–107.

The story of how an area can be rehabilitated by effective conservation practices when the local sports club secures the intelligent cooperation of an entire community in one of the counties of Minnesota.

What Are These "New" Virus Diseases? by Donald G. Cooley, *Redbook*, Dec. 1952, pp. 32–33 & 90–92.

Wide spread epidemics, distressing but rarely dangerous, temporarily disable many members of the community. This article tends to calm the fears of those affected even though it holds little hope of presently preventing or curing the diseases.

It Is Easy to Stay Healthy by J. D. Ratcliff, *American Mag.*, Dec. 1952, pp. 30–31 & 121–123.

Annual physical checkups are advised for everyone. This article gives you pointers as to how you can make the best use of the information resulting from your annual checkup.

Eavesdropper in the Woods by William Gilman, *Sat. Ev. Post*, Dec. 6, 1952, pp. 26–27 & 117–120.

Do people hear the woods as well as see it? Dr. Peter Kellogg does, and he has made it possible for many others to hear as well as to see and feel as they walk through the woods. Your bird call records will mean more to you after reading this article.

Bird Watching with an Electric Eye by William S. Dutton, *Colliers*, Dec. 27, 1952, pp. 66–69.

You will enjoy this marvelous set of pictures which were taken from the author's bedroom window.

America's Most Vicious Animal by John W. Noble, *Sat. Ev. Post*, Dec. 20, 1952, pp. 18–19 & 76.

Wild boars fear nothing and have nasty tempers. This article includes much information about the distribution and habits of these interesting though dangerous animals.

There's a Racket in Eyeglasses! by Jhan Robbins, *Redbook*, Nov. 1952, pp. 44–47 & 105–108.

Bargain prices and speedy service too frequently lure people to ill-trained "eye doctors." Read the facts which happen when the average citizen goes shopping for cheap eye care.

The Best News Yet on Polio by Steven M. Spencer, *Sat. Ev. Post*, Nov. 1, 1952, pp. 25 & 129–134.

The results of the latest experiment to determine the effectiveness of gamma globulin as a new weapon against polio. Globulin is not a treatment for the child sick with polio, but it is a good preventative.

They Deliver Your Baby at Home—Safely by Otis Carney, *Colliers*, Nov. 22, 1952, pp. 22–26.

Babies can be delivered at home without notable risk to either mother or child. The system worked out at the Chicago Maternity Center by Dr. De Lee and his co-workers makes birth comparatively safe even in shacks and tenements.

We Can—And the Reds Can Not by Robert Froman, *Colliers*, Nov. 15, 1952, pp. 46–49.

Ever think how dependent we are on the humble tin can? This article gives a good idea of the many ways we use this most excellent means of preserving our foods.

Editor's Note: If you find in the popular press any articles you think are of importance, even though they are a few weeks or months old, send one-sentence reviews to BROTHER H. CHARLES, F.S.C., *Saint Mary's College, Winona, Minnesota*, who is in charge of this column. And if you think this column is a good idea, drop a card saying so to the editor, or better still, to Brother Charles.

COVER PICTURES have not been submitted in as large numbers as the editor had hoped, and the majority of those submitted have not been satisfactory for reproduction. The unsuitable pictures have (1) lacked contrast, (2) had too "rough" or "fancy" a surface, (3) been too small. Pictures should be contrasty, on glossy paper, and not less than 5×7 inches. They should be black and white, not brown or sepia toned. There must be many good pictures in the files of the readers of ABT, and there must be many camera enthusiasts among the biology teachers.

THE ST. LOUIS MEETING

At a business session at the time of the Philadelphia meeting it was decided to discontinue the practice of devoting an issue of *The American Biology Teacher* entirely to the annual convention. It was deemed preferable to print news about the meeting in as early an issue as it is possible to get the material in print and to publish papers presented at the meetings whenever such papers are suitable for publication, with the usual footnote stating that the paper was a contribution at the national meeting. The new officers are announced in this issue; the condensed minutes will probably be ready for next month; one or more of the papers presented on programs will no doubt appear in the March issue. Subsequent issues will bring others, thus the journal will, as in years past, bring to its readers as many of the highlights of the convention as is practical. But instead of trying to bring most of them together in a single issue, with the inevitable difficulties of meeting deadlines, and the "hurrying" of papers for publication, the reporting of the convention will be spread over the entire Volume of the journal.

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